WESTMINSTER

SEWAGE TREATMENT PLANT

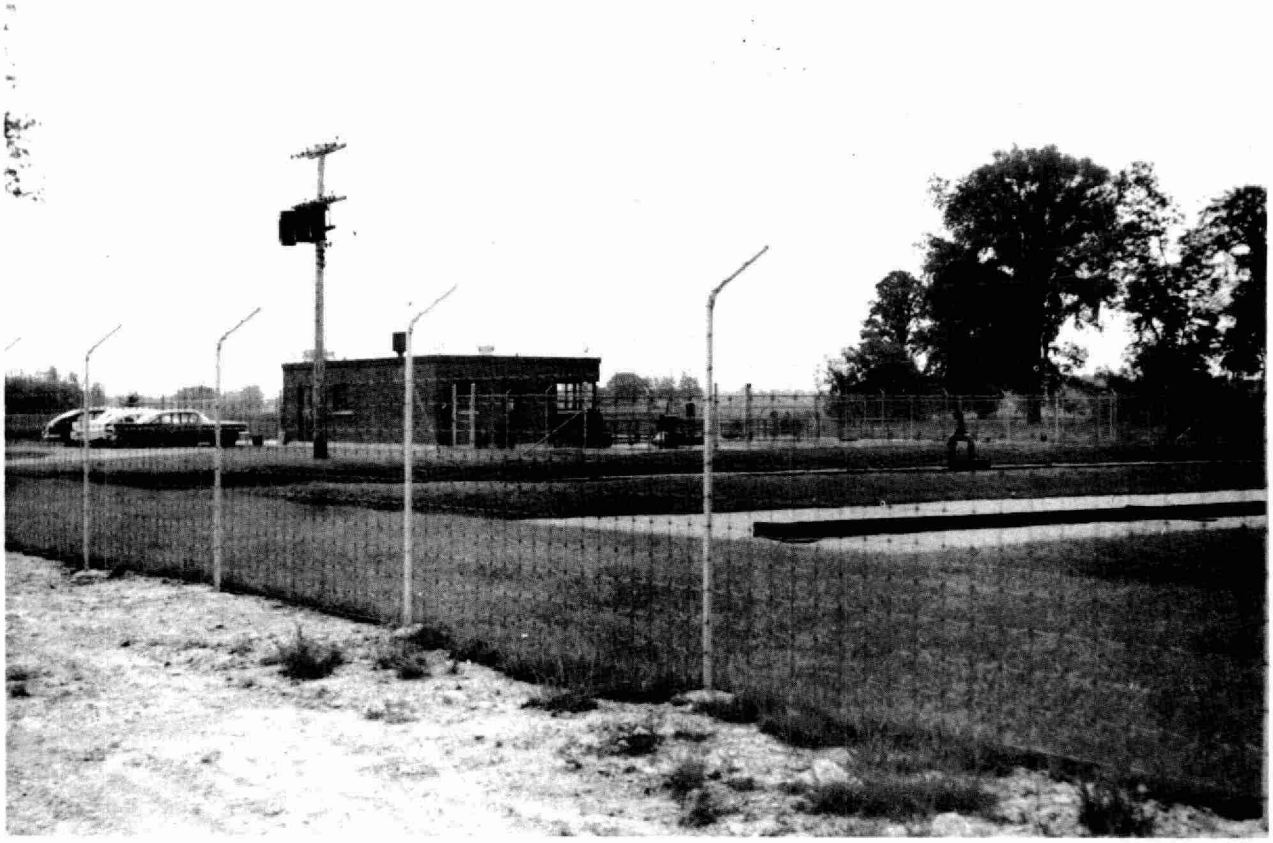
ANNUAL REPORT

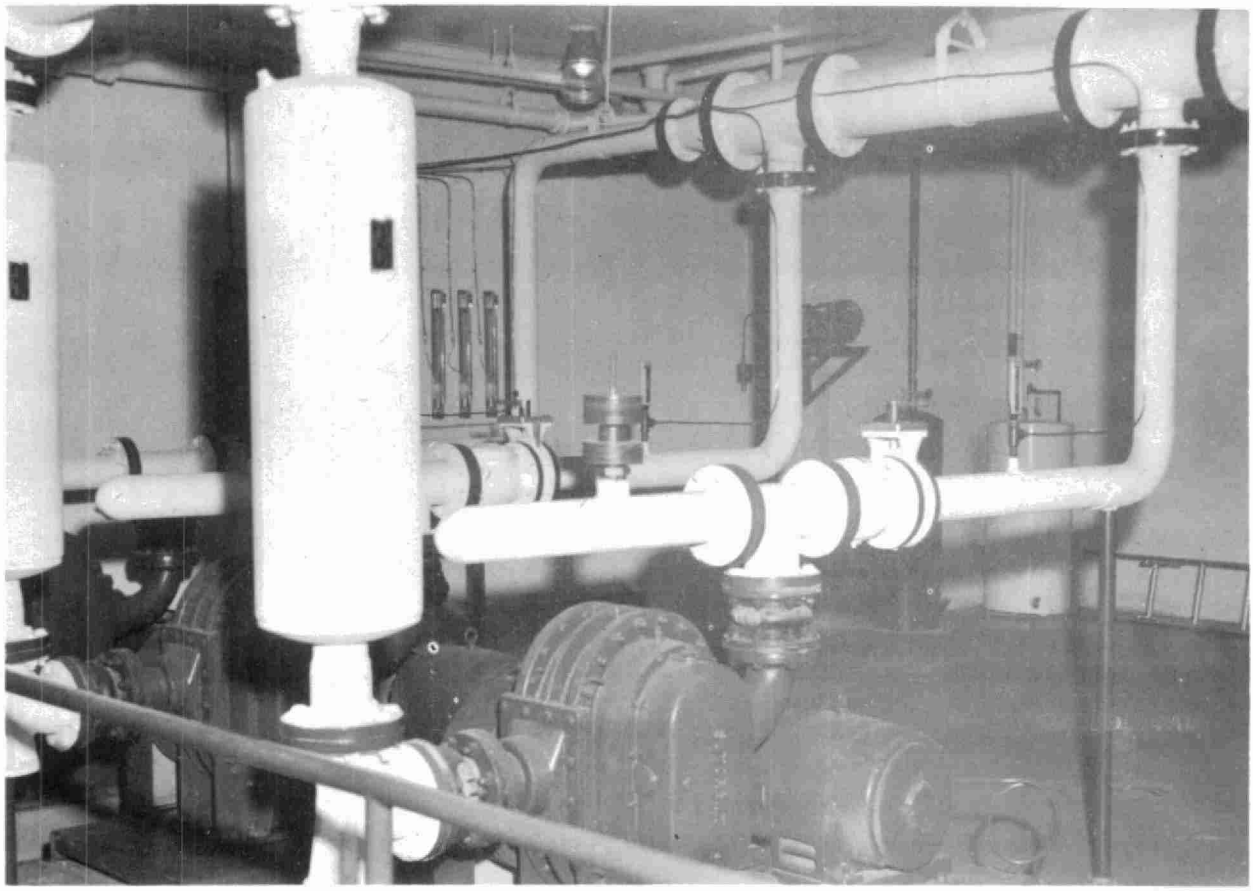
1960

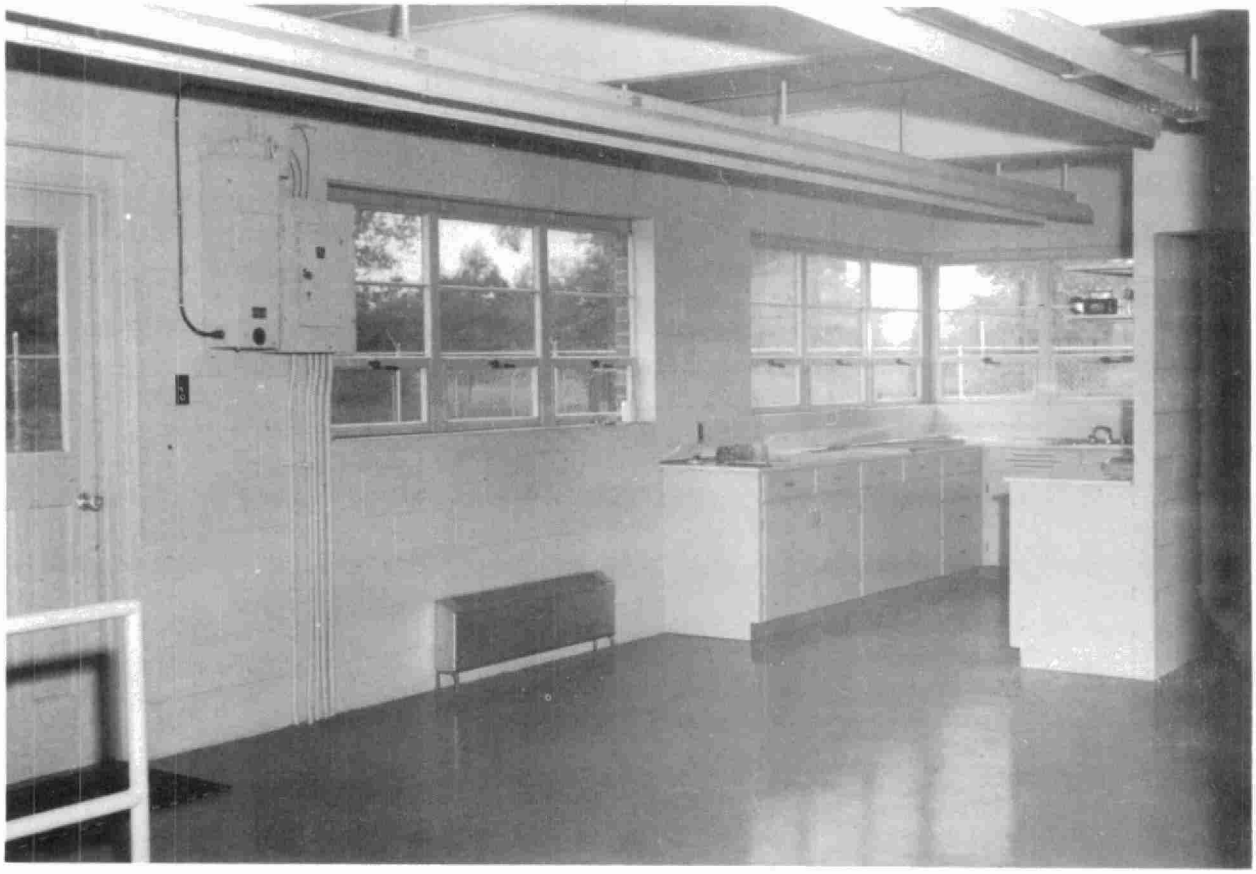
PREPARED BY

THE DIVISION OF PLANT OPERATIONS

ONTARIO WATER RESOURCES COMMISSION







WESTMINSTER TOWNSHIP SEWAGE TREATMENT PLANT

OWRC PROJECT 59-S-33

GENERAL INTRODUCTION

During 1959, proposals for a sewage treatment plant to serve a new industrial area in the Township of Westminster were submitted to the Ontario Water Resources Commission. Consulting Engineers for the project were S. G. Chipman and Co., London, Ontario. O.M.B. approval was granted and the OWRC entered into an agreement with Westminster Township to finance, construct and operate the new sewage project. Tenders were called on May 19, 1959 and the contract for the plant was awarded to the Frid Construction Co. Ltd., Hamilton; the contract for the sanitary sewers was awarded to W. A. Haggerty Construction Ltd., Ingersoll. Construction work was completed in December 1959.

DESCRIPTION OF PLANT

Type of Plant - Total Oxidation Process.

Design Capacity - 250,000 Imp. Gals./Day.

INFLUENT

The raw sewage flows into the plant through a 21 inch diameter sewer. It enters the flow channel in the upper part of the wet well and is directed by gates either through the 12 inch Barminutor or through the bar screen installed in the by-pass channel. The raw sewage then drops into the wet well of the raw sewage pumps. It is then pumped from the wet well into the flow channel at the head of the aeration tanks. There are two centrifugal raw sewage pumps located in the dry well with provision for a third pump in the future. These pumps operate automatically, being controlled by the water level in the wet well. The raw sewage pumps are wired so that, should there be a power failure, the gasoline standby motor automatically comes on and continues the pumping.

AERATION TANKS

The two aeration tanks have a combined volume of 252,000 imperial gallons. Here the sewage is aerated for a 24 hour period by a diffused air system located in each tank along the lower side of one wall. Air is supplied by three blowers, two of which are sufficient for total design flow. The third blower is a standby in the event of a mechanical breakdown of the other two, or if any abnormal condition occurs.

FINAL SETTLING TANKS

The effluent from the aeration tanks then flows into the two final settling tanks. These have a total volume of 48,500 imperial gallons giving a detention period of 4½ hours at design flow. A wooden baffle is provided at the inlet which guards against short circuiting and insures good settlement of the sludge. The sludge settles to the bottom of the tanks and is scraped to the sump at the end of the tanks by the wooden flights of the collector system. The flights are brought to the surface to remove the grease and scum.

RETURN SLUDGE

The sludge collected in the final settling tank sump is drawn by gravity through the 4 inch diameter gravity slip pipes and spills out into the sludge hopper. The sludge in the hopper is then pumped back into the flow channel at the head of the aeration tanks. The return sludge pump is located in the dry well and is equipped with a vari-drive to permit changing the speed and capacity. Should the system become overloaded with excessive sludge, the excess sludge is wasted to a sludge holding tank. The contents of this tank are pumped out occasionally and trucked away.

CHLORINE CONTACT CHAMBER

The effluent from the final settling tank flows through the chlorine contact chamber which has a volume of approximately 4,000 imperial gallons.

A chlorine solution is fed into the chamber by a vacuum chlorinator and a 20 minute contact period is allowed. The effluent then passes through a 21 inch diameter sewer to Dingman Creek.

EFFLUENT SAND FILTER BEDS

The sand filter beds will normally be used only during the summer months when there is very little flow in the creek. There are four beds, each 42' x 160' and each has its own distribution trough and control valve. The filtered effluent is collected in an under drain system and discharged to Dingman Creek.

OPERATION

The construction of the plant was completed in December 1959, however, during the first four months of 1960 the raw sewage pumps were the only pieces of equipment in operation. The pumps were used to handle the very limited flow consisting solely of infiltration and a small quantity of domestic sewage originating from the newly constructed Northern Electric plant.

During January and February, weekly visits were made by head office staff to inspect the plant. Arrangements were then made to have Mr. W. E. Simpson, the operator, inspect the installation daily until such time as the flow increased to enable full operation. On May 10, 1960, Mr. W. E. Simpson commenced full time employment with the OWRC and the plant was put into operation.

During the initial stages, several minor problems occurred with the equipment. Through the cooperation of the consulting engineer and the contractor these difficulties were soon rectified under the warranty. A lubrication and maintenance schedule was drawn up by the head office staff and Mr. Simpson has done an excellent job in operating and servicing the equipment.

A weekly sampling routine was put into effect early in July. Samples are taken of the raw sewage and final effluent for B.O.D. and suspended solids determinations. The results of these tests provide an indication of the loading and efficiency of the plant. Sampling of Dingman Creek in the vicinity of the plant is also carried out on a weekly basis to determine the effect of the effluent on the stream.

B.O.D. and suspended solids removals have been consistently good as shown on the accompanying graphs. Laboratory results have also indicated that the plant effluent has had no serious effect on the receiving stream. All of the above samples are analyzed at the OWRC laboratories in Toronto. In addition to the above, the operator performs daily several laboratory tests for control of the process. Operating data and laboratory results are recorded and submitted weekly to the Division of Plant Operations. In this way, the plant is operated in an economical and efficient manner.

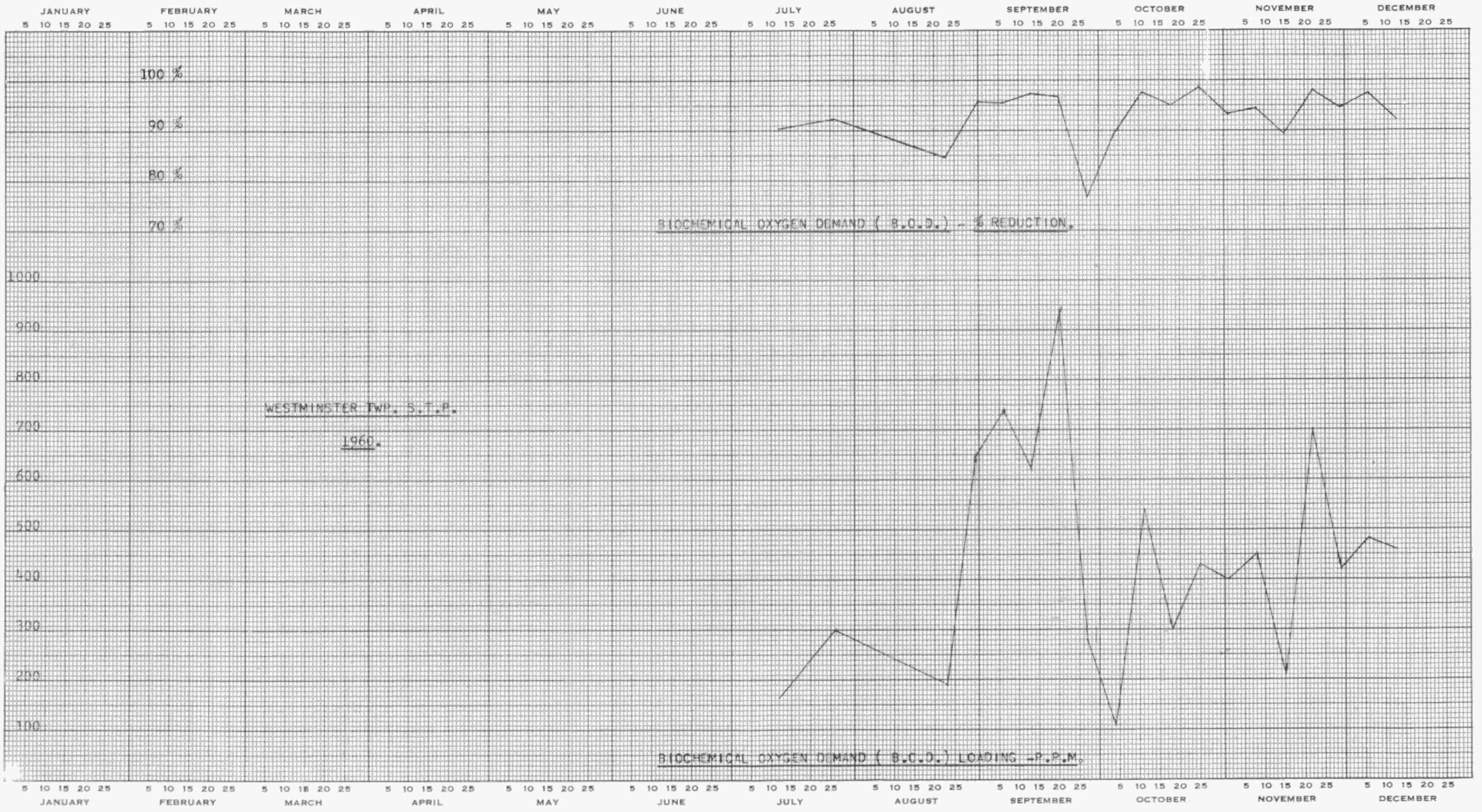
During September, oil and grease began showing up on the surface of the aeration and final tanks. The Northern Electric Company currently the only source of sewage were notified but they have been unable to determine the origin of the material. Samples were sent to the OWRC laboratories and examined by infra-red spectroscopy. The samples were found to contain petroleum lubricating oils. The infra-red spectra of the separated oils did not indicate the presence of animal or vegetable fats or oils. The operator has been skimming the oil from the tanks and burying it in a nearby pit. The Industrial Wastes Branch of the OWRC has been notified and are going to investigate the problem.

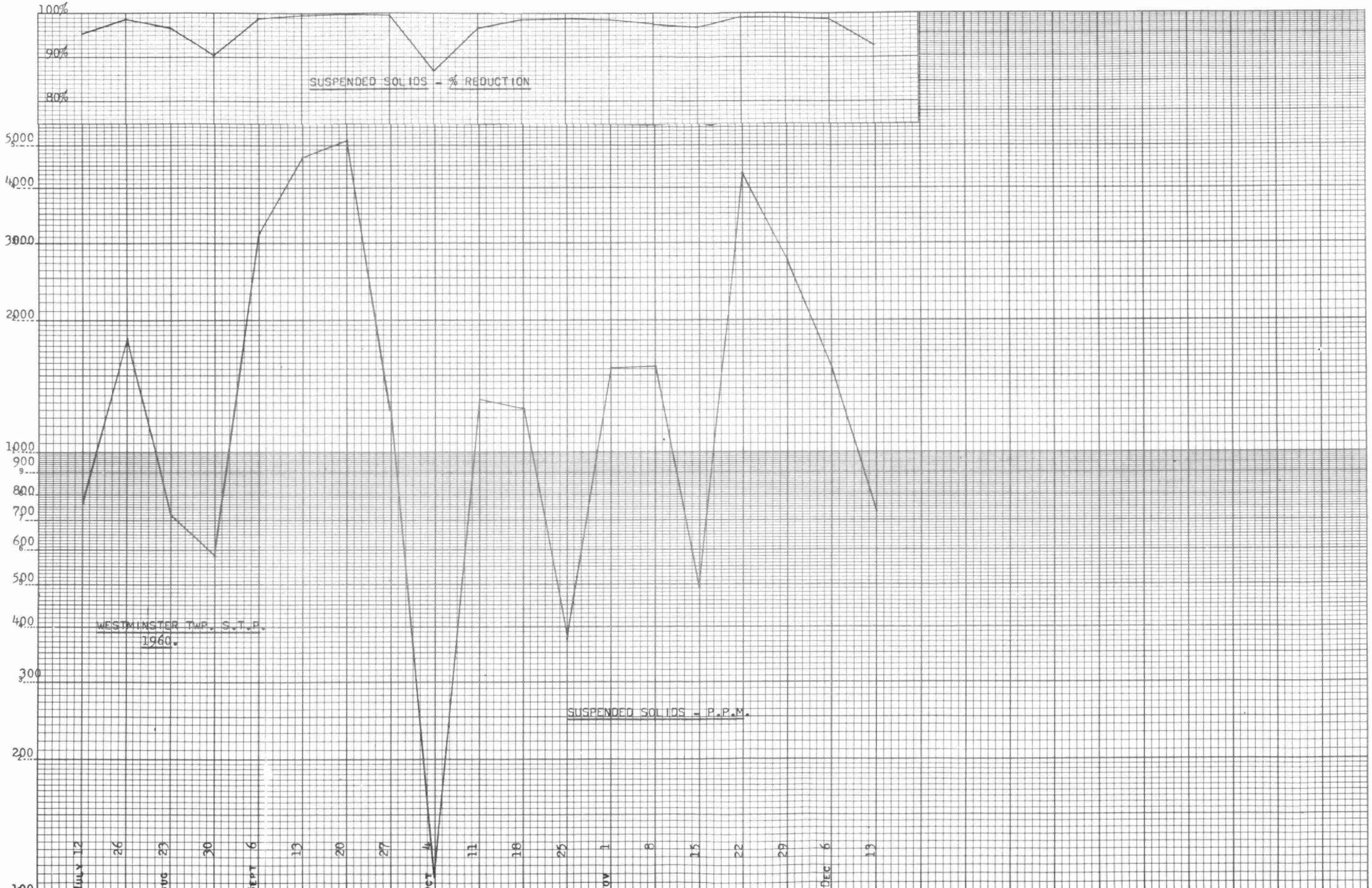
Ice began to build up in the final settling tank during a severe cold period in the latter part of December. For several days during the holiday season, Mr. Simpson spent considerable time day and night removing ice

from the clarifier mechanism to keep the plant in operation. This problem was a result of low flow coupled with a low temperature of the sewage. Shortly after this period, the pyrotenax cable to a clarifier motor burned out and was temporarily wired. A new conduit will be installed in the near future. Despite the above mentioned problems this project has performed well and has consistently turned out a satisfactory effluent.

Operating expenses include the following: payroll, fuel, power, chemicals, general supplies, equipment, maintenance and repairs, and miscellaneous items. The total operating costs incurred during the year 1960 amounted to $5,732.75. The total estimated operating expenses excluding insurance for the year 1961 amount to $7,200.00.

Approximately twenty inspection visits have been made to this project by Plant Operations personnel since it was placed in full operation. There are no charges made for the services rendered by head office staff.


JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
5 10 15 20 25
100 %
90 %
80 %
70 %
BIOCHEMICAL OXYGEN DEMAND (B.O.D.) - % REDUCTION.
1000
900
800
700
600
500
400
300
200
100
WESTMINSTER TWP. S.T.P.
1960.
BIOCHEMICAL OXYGEN DEMAND (B.O.D.) LOADING - P.P.M.


100%
90%
80%
SUSPENDED SOLIDS - % REDUCTION
5000
4000
3000
2000
1000
900
800
700
600
500
400
300
200
WESTMINSTER TWP. S.T.P.
1960.
SUSPENDED SOLIDS - P.P.M.
JULY 12
26
AUG 23
30
SEPT 6
13
20
27
OCT 4
11
18
25
NOV 1
8
15
22
29
DEC 6
13